Leaf Area Index for
Fire Chronosequences in
Siberian Boreal Forest

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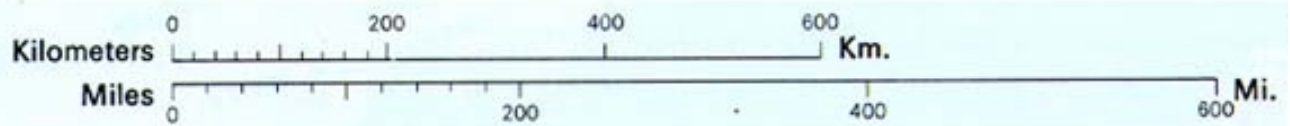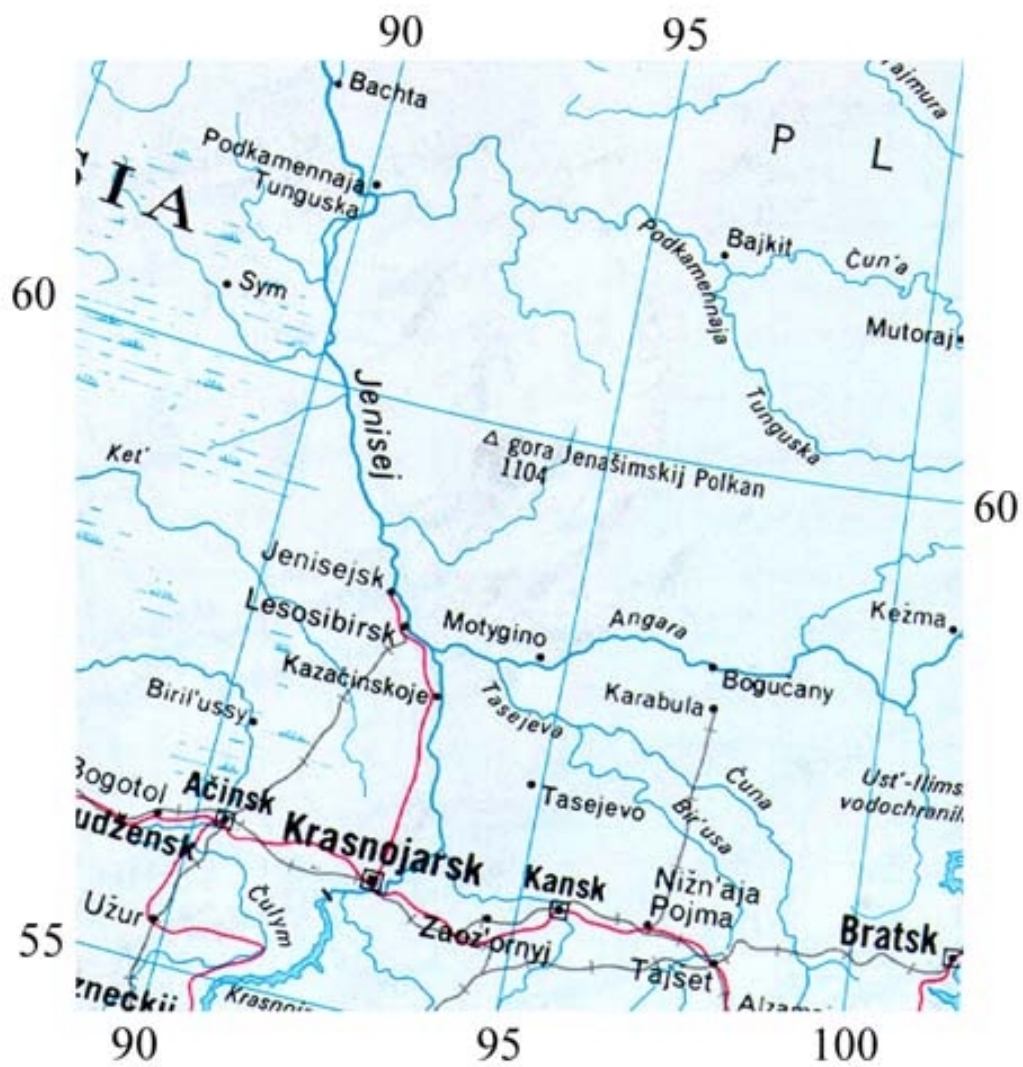
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Study Goals

- Determine LAI for a chronosequence of post-fire boreal forest
    - Direct and indirect surface measurements of LAI
    - LAI from satellite imagery including Landsat 7, MODIS, and MISR
    - Link surface and satellite estimates of LAI
    - Extrapolate LAI from plot to site to regional scales
    - Simulate LAI using Biome-BGC

IGBP
West
Tran-
sect

P-OV TAYMYR

SVALBARD
(SPITSBERGEN)
(Nor.)

ZEMLYA
FRANTSA-IOSIFA
(FRANZ JOSEF LAND)

SEVERNAYA ZEMLYA
(NORTHERN LAND)

M. CHELYUSKIN

LAPTEV
SEA

NOVOSIBI
(NE

NOVAYA ZEMLYA

KARA SEA

70°

60°

40°

100°

120°

140°

Nizhnyaya   Tunguska

Olenek

Study
Area

Yeniseysk o

Tobol'sk

Omsk

Tomsk °

Krasnoyarsk

Tayshet

S   I   B   E   R   I   U   N

NOVOSIBIRSK

KHREBET

Irkutsk

selinograd

SAYAN

Kyzyl

Bai

palatinsk

Jirgalanta

Ulaan Ba

Jibhalanta

ALTAI MTS.

S   O   N   G   O

Tihua

Relief

Meters		Feet
3050		10 000
1525		5000
610		2000
305		1000
Sea Level		0

| Kilometers | 0 | 200 | 400 | 600 | Km. |
| Miles | 0 | 200 | 400 | 600 | Mi. |

Accomplishments

- Established collaborations with Sukachev Institute of Forest Research
- Analysis of historical Landsat TM data
- Site Selection
- Field Campaign:
  - August 8-27, 1999
  - 2 sites: primary forest and one burned in 1999. 5 plots in each site

Measurements

Leaf Area Index
- Licor LAI-2000
- TRAC
- Destructive (direct) sampling
- Hemispheric photographs

General Forestry
- Stand density
- Overstory species composition
- Tree height
- Canopy cover
- Ground cover species composition

Background Reflectance
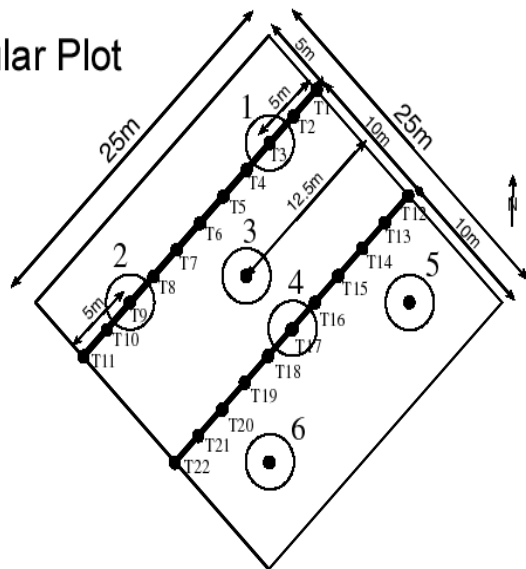- Dominant overstory and understory species

Biogeochemistry
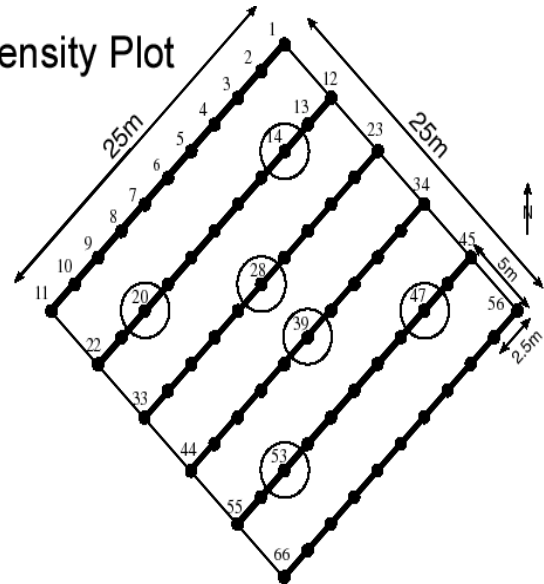- Soil profile
- Soil C and N
- Needle C and N

Plot Description

Regular Plot

LAI-2000 Measurement, Hemispheric Photograph, Prism Sweep, Ground Cover, Canopy Cover (#1-6)
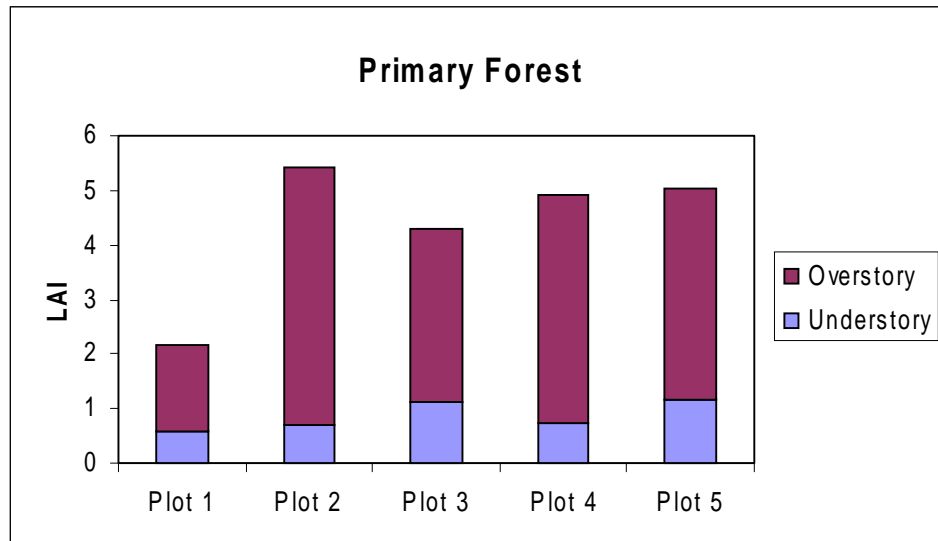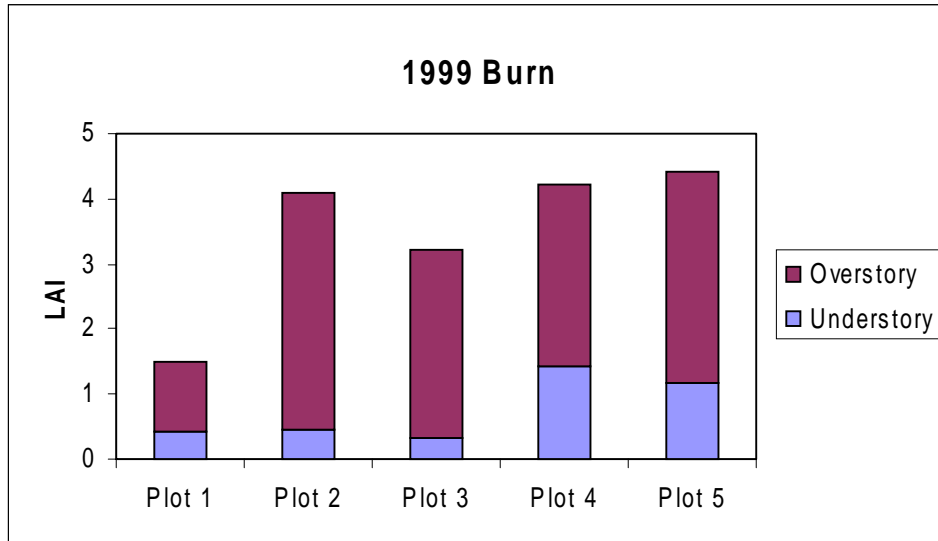
TRAC Transects

High Intensity Plot

LAI-2000 Measurement (odd numbers 1-11, 23-33, 45-55; even numbers 12-22, 34-44, 56-66)

Hemispheric Photograph, Prism Sweep, Ground Cover, Canopy Cover (#14, 20, 28, 39, 47, 53)

TRAC Transects

Preliminary LAI Results*

1999 Burn

Primary Forest

* Results based on Licor LAI2000 measurements

Plans for 2000

- Field Campaign
  - Establish 3rd site that burned 8-15 years ago
  - Full suite of measurements in 1999 sites and in newly established site
  - Collect data necessary for modeling effort: vegetation litter, meteorological data, etc.
  - Satellite data: Landsat, MODIS, MISR